REMARKS

Claims 2, 6-8, 15 and 22-39 are pending in the application. Claim 1 is amended to correct an obvious typographical error. Claim 40 has been added. Support for Claim 40 is found in Claim 6 and 26.

No new matter has been introduced by way of this Amendment. Applicants respectfully request entry of Claim 40 because it recites all the limitations of Claims 6 and 26 which the exception of "cinnamic aldehyde." Thus, Claim 40 does not touch the merits of the case in that consideration of the claim does not require a new search.

Favorable consideration of the following comments relative to the outstanding rejections as they may apply to the present claims is respectfully requested for the reasons that follow.

A. Interview Summary

On October 2, 2003, Diane Mason and David Stec conducted a telephonic interview with the Examiner. Applicants submitted an Applicant Initiated Interview Request by facsimile on September 29, 2003. The Examiner notified Applicants of the acceptance of the Request by telephone on October 1, 1993. As required by 37 C.F.R. § 1.133, Applicants submit herein a written statement of the reasons presented at the interview as warranting favorable action.

During the interview, Applicants maintained that the claims which are drawn to a method of using a composition comprising an aromatic aldehyde that is free of antioxidants other than the aromatic aldehyde are not obvious in view of Sotome. Applicants reasoned that Sotome's disclosure of the aromatic aldehyde, cinnamic

aldehyde, with an antioxidant, teaches away from the claimed invention and, therefore, either alone or in combination with the secondary references does not establish a *prima facie* case of obviousness.

B. Double Patenting Rejection

Claims 2, 6-8, 15, 22-24, 25-28 and 31-34 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, and 7-12 of U.S. Patent No. 5,839,224 in view of Sotome (U.S. Patent No. 4,978,686) and Tsuei (U.S. Patent No. 5,589,194).

Claims 2, 6-8, 15, 25-28, 30-32, 36, 38, and 39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,251,951.

Applicants defer responding to the double patenting rejections until there is an indication of otherwise allowable subject matter.

C. 35 U.S.C. § 103 Rejections

1. Sotome (US 4,987,686), Tsuei (5,589,194), Yamashita (5,696,094) and Frear (IDS C5)

Claims 2, 6-8, 15, 22-32, 36, 38, and 39 are rejected under 35 U.S.C. § 35(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, and Frear. Applicants respectfully traverse the rejection.

Sotome describes a method of protecting crops from insect pests, microorganisms and pathogenic microbes that employs a composition comprising cinnamic aldehyde and an antioxidant. Examples of antioxidants include vitamin E, *n*-propylgallate, BHT,

eugenol, Sankanon, and L-ascorbyl stearate. (*see* Column 3, lines 5-10; Table 1). The composition of Sotome is prepared to form an emulsion comprising cinnamic aldehyde and an antioxidant. (*see* Example 1).

Tsuei *et al.* describe a method of making microcapsules by dispersing or dissolving a component in a solid, matrix-forming material that has been thermally softened. Solid matrix-forming materials include waxes, such as, carnauba and beeswax. (*see* Column 4, lines 53-67). Tsuei *et al.* disclose that microencapsulation has a number of advantages and may protect the component from oxidation. (*see* Column 4, lines 53-67).

Yamashita describes a method of inhibiting soil borne animals that are plant pathogens, such as nematodes, by treating the pathogen with lignosulfonate. Treatment with lignosulfonate penetrates the pathogen's cuticle thereby increasing the pathogen's susceptibility to soil microbes.

Frear describes the use of saponins as a spreading and wetting agent in insecticide sprays.

In contrast, independent Claim 2 is drawn to a method of providing a susceptible plant with sustained resistance to pathological microorganisms by administering to the plant a nonphytotoxic composition comprising at least one aromatic compound having Formula (1) (*see* page 10, lines 1-8) that is free of antioxidants. Independent Claim 26 is drawn to a method of administering to a susceptible plant a nonphytotoxic composition comprising an aromatic compound selected from the group consisting of cinnamic

aldehyde, α-hexyl cinnamic aldehyde, α-amyl cinnamic aldehyde, coniferyl aldehyde and combinations thereof that is free of antioxidants.

To reject a claim under § 103(a), the Examiner must "present a line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." M.P.E.P. § 2142 (citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. Appl. & Inter. 1985). This requires the rationale for the rejection to meet the three basic criteria set forth in M.P.E.P. § 2143:

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.
>
> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness." M.P.E.P. § 2142.

In the present case, the prior art, alone or in combination, does not disclose each of the elements of independent Claims 2 or 26. As the Examiner has acknowledged, Sotome does not teach or suggest the use of a nonphytotoxic composition that does not contain an antioxidant. Rather, Sotome expressly teaches the use of antioxidants and provides methods of using antioxidants in an emulsion with cinnamic aldehyde.

Sotome teaches that in the absence of an antioxidant the antimicrobial activity of cinnamic aldehyde is maintained for only 30 days. In Example 1, Sotome compares the microbe inhibiting effect of cinnamic aldehyde in an emulsion with an antioxidant (BHT: Emulson A) and without an antioxidant (Emulson B). The microbes tested represent five different genera of fungi. Sotome concludes that "Emulsion B lost its effect 30 days after the start of the test . . . whereas Emulsion A maintained its effect for the same time of [sic] period." (*see* Column 6, lines 44-46). Sotome reaches the same conclusion in Example 2 in which the microbe inhibiting effects of Emulsions A and B were tested by transplanting cucumber seedlings with developed fifth leaves in soil contaminated with *Fusarium oxysporum*. (*see* Column 7, lines 16-19). Sotome concludes based on the results shown in Table 3 that "in the case of the antioxidant-free Emulsion B, the microbe inhibiting effect was greatly lowered, while in the case of Emulsion A . . . the microbe inhibiting effect was maintained even after 30 days[.]" (*see* Column 7, lines 30-34).

In contrast to the results of Sotome, Example 1 of the specification demonstrates that one treatment of a composition of antioxidant-free cinnamic aldehyde eradicated powdery mildew, rust, and spores from plants over an 8 week field study. (*see* p.37, lines 24-28). Compositions of antioxidant-free cinnamic aldehyde also eradicated merlot plants of the insect *Phylloxera* over a 5 week period. (*see* p.49, Table 7). Thus, Applicants respectfully assert that Sotome teaches away from the use of antioxidant-free aromatic aldehyde compositions by stating that antioxidants are required to maintain the antimicrobe activity of cinnamic aldehyde. Thus, Sotome teaches away from the present

invention of providing resistance to pathological microorganisms without the use of antioxidants and cannot support a legal conclusion of obviousness.

The secondary references, either alone or in combination, do not cure the defect in the teaching of Sotome. The Examiner acknowledges that Tsuei *et al.* disclose a microencapsulation technique, Yamashita discloses nematodes as plant pathogens, and Frear discloses the use of saponin as a surfactant in insecticides. Thus, none of the references, either alone or combination with Sotome, teach or suggest the nonphytotoxic composition of Claim 2 or 26 that is antioxidant free.

Moving to the remaining issues required to establish a *prima facie* case of obviousness, Applicants respectfully submit that all of the claimed elements are not disclosed in the references and, therefore, there can be no suggestion that they be combined to arrive at the present invention. Without disclosure of all of the claimed elements and no suggestion that the references be combined, the references do not provide a reasonable expectation of success of arriving at the claimed invention. Thus, Sotome, Tsuei *et al.*, Yamashita and Frear do not support a *prima facie* case of obviousness.

In another aspect of the rejection, the Examiner contends that a microcapsule of beeswax or carnauba wax as disclosed by Tsuei *et al.* is an antioxidant. Applicants respectfully disagree and contend that "antioxidant" is an art recognized term that means a molecule in a composition that prevents its deterioration by contact with air. For example, "chemistry.about.com" defines antioxidant as:

> An enzyme or other organic molecule that can counteract the damaging effects of oxygen in tissues. Although the term technically applies to molecules reacting with oxygen, it is often applied to molecules that protect from any free radical (molecule with unpaired electron).

http://chemistry.about.com/library/glossary/bldef350.htm. "Dorland's Medical Dictionary" defines antioxidant as:

> [O]ne of many widely used synthetic or natural substances added to a product to prevent or delay its deterioration by action of oxygen in the air. Rubber, paints, vegetable oils, and prepared foods commonly contain antioxidants.

Dorland's Illustrated Medical Dictionary 104 (17th ed. 1988). "General Chemistry Online!" defines antioxidant as:

> [C]ompounds that slow oxidation processes that degrade foods, fuels, rubber, plastic, and other materials. Antioxidants like butylated hydroxyanisole (BHA) are added to food to prevent fats from becoming rancid and to minimize decomposition of vitamins and essential fatty acids; they work by scavenging destructive free radicals from the food.

http://antoine.frostburg.edu.chem/senese/101/glossary/a/shtml. In addition, the antioxidants disclosed by Sotome, which include vitamin-E, *n*-propyl gallate, BHT, eugenol, Sankanon, and L-ascorbyl stearate that are used as an emulsion with cinnamic aldehyde, are within the ambit of the above definitions. Thus, Applicants respectfully disagree with the Examiner's position that the microcapsule of Tsuei *et al.* comprising a thermally softened solid matrix-forming material is an antioxidant.

Regarding Tsuei *et al.* and Frear, Applicants respectfully assert that these references are not properly cited against the claimed invention. Tsuei *et al.* and Frear are cited in the Office Action for disclosing microencapsulation techniques and surfactants, respectfully. The disclosures of these references in connection with this subject matter

are not in dispute. The issue is that Tsuei *et al.* and Frear are cited for teachings that are not elements of independent Claims 2 or 26. Thus, their use in the rejection of at least these claims is improper.

In view of these arguments, Applicants respectfully request that the rejection of Claims 2, 6-8, 15, 22-32, 36, 38 and 39 under § 103(a) be withdrawn.

2. Sotome (US 4,987,686), Tsuei *et al.* (5,589,194), Yamashita (5,696,094), Frear (IDS C5) and Winston (US 5,415,877)

Claims 33-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, Frear and Winston. Applicants respectfully traverse.

Summaries of Sotome, Tsuei *et al.*, Yamashita and Frear are provided above.

Winston discloses a fungicide formulation comprising sodium bicarbonate.

Claim 33 is drawn to a method of administering to a susceptible plant a nonphytotoxic composition comprising an aromatic compound selected from the group consisting of cinnamic aldehyde, α-hexyl cinnamic aldehyde, α-amyl cinnamic aldehyde, coniferyl aldehyde and combinations thereof that is free of antioxidants and further comprises a salt of a polyprotic acid. Claim 34 depends from Claim 33 and states that the salt of a polyprotic acid is sodium bicarbonate.

Applicants respectfully assert that Sotome, Tsuei *et al.*, Yamashita, Frear and Winston either alone or in combination do not establish a *prima facie* case of obviousness. As the Examiner has acknowledged, none of the references teach or suggest a nonphytotoxic composition comprising an aromatic aldehyde selected from

cinnamic aldehyde, alpha-hexyl cinnamic aldehyde, α-amyl cinnamic aldehyde, and coniferyl aldehyde that is free of antioxidants. Thus, the references do not teach or suggest all the claim limitations, do not teach or suggest their combination to arrive at the claimed invention, and do not provide a reasonable expectation of success.

In addition, Tsuei *et al.* and Frear are not properly cited against Claims 35 and 37 for the reasons set forth above.

In view of these remarks, Applicants respectfully request the rejection of Claims 33 and 34 under § 103(a) be withdrawn.

3. Sotome (US 4,987,686), Tsuei *et al.* (5,589,194), Yamashita (5,696,094), Frear (IDS C5) and Keane *et al.* (US CAPLUS Abstract AN 1979:471805)

Claims 35 and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sotome in view of Tsuei *et al.*, Yamashita, Frear and Keen *et al.* The Examiner contends that Keen *et al.* teach that coniferyl aldehyde is known to be useful as an antimicrobial agent for the protection of plants. Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, to employ coniferyl aldehyde in the method of Sotome because coniferyl aldehyde is structurally similar to cinnamic aldehyde and is a known antifungal agent. Applicants respectfully traverse.

Claims 35 and 37 depend from Claims 2 and 26, respectively, and limit the aromatic compound of each claim to alpha-hexyl cinnamic aldehyde, α-amyl cinnamic aldehyde, and coniferyl aldehyde.

As previously stated, Sotome does not teach or suggest a nonphytotoxic composition that is free of antioxidants. Rather, Sotome expressly teaches the use of antioxidants. Keen *et al.*, like the other references cited against the claims, do not cure the defect of Sotome *vis-à-vis* a nonphytotoxic composition that is antioxidant free. Contrary to the Examiner's opinion, the result of the combination of the coniferyl aldehyde of Keen *et al.* with the disclosure of Sotome is a composition comprising coniferyl aldehyde and an antioxidant. This composition is not an element of Claim 35 or 37, which recite the element "free of antioxidants." Thus, the combination of Keen *et al.* with Sotome and the other references does not teach or suggest all the claim limitations and for the reasons set forth above does not establish a *prima facie* case of obviousness.

In addition, Tsuei *et al.* and Frear are not properly cited against Claims 35 and 37 for the reasons set forth above.

In view of these remarks, Applicants respectfully request the rejection of Claims 35 and 37 be withdrawn.

CONCLUSION

Applicants respectfully submit that the claims are now in condition for allowance and an early notification of such is solicited. If, upon review, the Examiner feels there are additional outstanding issues, the Examiner is invited to call the undersigned attorney at (415) 781-1989.

Respectfully submitted,

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Dated: Oct. 3, 2003 By: _____

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